58,377/B Supp.

BIRD, F.

Digitized by the Internet Archive
in 2016

https://archive.org/details/b28739310

SANGUINARIA CANADENSIS.

To Dr W. P. Waynes with the
sincerest wishes of the
Author

AN

INAUGURAL DISSERTATION

ON THE

SANGUINARIA CANADENSIS

OF

LINNÆUS.

BY FITZGERALD BIRD,
OF GEORGIA,
MEMBER OF THE MEDICO-CHIRURGICAL SOCIETY OF THE UNIVERSITY
OF THE STATE OF NEW-YORK.

> Ex operibus et experimentis causas et axiomata, atque ex causis et axiomatibus rursus nova opera et experimenta extrahamus.—*Bacon Nov. Org.*

NEW-YORK:
PRINTED BY H. SAGE, 208 BROADWAY.
1822.

319532

WELLCOME
LIBRARY
INSTITUTE

AN

INAUGURAL DISSERTATION

ON THE

SANGUINARIA CANADENSIS:

SUBMITTED

TO THE PUBLIC EXAMINATION

OF THE

TRUSTEES OF THE COLLEGE OF PHYSICIANS AND SURGEONS

OF THE

UNIVERSITY

OF THE STATE OF NEW-YORK,

WRIGHT POST, M. D. PRESIDENT.

FOR THE

Degree of Doctor of Medicine,

On the 2d day of April, 1823.

TO

ARCHIBALD B. RIDLEY, M. D.

OF GEORGIA.

Having commenced my medical studies under your direction, I seize the opportunity to do justice to my feelings, in thus publicly expressing my obligations for the instruction I have received under your guidance, as well as for innumerable kind offices I have experienced at your hands.

With feelings of the highest respect,

I am, &c.

FITZGERALD BIRD

TO

DAVID HOSACK, M. D. LL. D.

F. R. S. L. and E.

Professor of the Institutes and Practice of Medicine in the University of the State of New-York; President of the New-York Historical Society, &c. &c. &c.

THIS

DISSERTATION IS DEDICATED

WITH

SENTIMENTS OF THE HIGHEST RESPECT

FOR

HIS DISTINGUISHED TALENTS

AND

PROFESSIONAL EMINENCE,

BY HIS PUPIL,

THE AUTHOR.

TO

JOHN W. FRANCIS, M. D.

Professor of Obstetrics, and the Diseases of Women and Children, in the University of the State of New-York; Member of the Medical and Chirurgical Society of London; of the Medico-Physical Society of New-Orleans; of the Massachusetts Historical Society; of the American Antiquarian Society; of the Literary and Philosophical Society of New-York; of the Academy of Natural Sciences of Philadelphia; President of the Medico-Chirurgical Society of the University of the State of New-York, &c. &c.

THIS

DISSERTATION

IS

GRATEFULLY INSCRIBED

BY HIS AFFECTIONATE PUPIL,

THE AUTHOR

PREFACE.

THE *object of the following Dissertation is to ascertain the medical virtues of one of our indigenous productions, and thus increase the Materia Medica of the United States. The writer is indebted to his benevolent preceptor, Dr.* JOHN W. FRANCIS, *for making him acquainted with the* SANGUINARIA CANADENSIS, *one of the most common of our vegetable productions, as affording a most fruitful field for investigation. The subject seemed to divide itself into three general heads, and accordingly, it has been considered, first, as regards its botanical description; secondly, as to its properties as ascertained by chemical analysis; and, thirdly, as an article of medicine. Under the first head, little more has been done than to offer the reader a concise botanical account of the plant. As to the second head, with a view of distinctly ascertaining its chemical properties, a series of experiments was instituted: these have been detailed in a brief, but, it is hoped, satisfactory* *manner; and with the observations made upon the experiments, the properties of this plant, as far as ascertained by analysis, are given. In the third division of the subject, the application of the Sanguinaria Canadensis, as an article of the Materia Medica, is considered. Its utility in this respect, has not been exaggerated, as nothing has been asserted that experiment does not warrant.*

A

DISSERTATION

ON THE

SANGUINARIA CANADENSIS

OF

LINNÆUS.

THE Sanguinaria Canadensis, according to the artificial system of Linnæus, is arranged under the class Polyandria, order Monogynia, and is described in the following manner :

CAL. *Periantheum* diphyllum, ovatum, concavum, corolla brevius, caducum.

COR. *Petala* octo, oblonga, obtusa, patentissima : *alterna* interiora angustiora.

STAM. *Filamenta* plurima, simplicia, corolla breviora. *Antheræ* simplices.

PIST. *Germen* oblongum, compressum, *Stylus* nullus. *Stigma* crapiusculum, bisulcatum stria, altitudine staminum, persistens.

PER. *Capsula* oblonga, ventricosa, utrinque acuta, bivalvis.

SEM. Plurima, rotunda, acuminata.

Linnæus, in his natural orders, has placed the Sanguinaria Canadensis among the Rhæadeæ, L. Papaveraceæ. *Jus.*

We know of but one species of the genus Sanguinaria. A variety is described by Mr. Pursh, as having linear petals; the same has also been collected in Georgia, by Mr. Lyon. As the variety, however, is limited to the flower, the medicinal virtues are, in all probability, the same. There is a great propensity in the Sanguinaria to multiply its petals in favourable situations; and, it is probable, by proper culture, a double variety may be produced. The Sanguinaria major flore pleno, as marked by Dillenius, proves that such a change has been effected in it.

This plant is generally known throughout the United States, by the name of Blood Root; a name, no doubt, given to it from the circumstance of the red juice which pervades every part of the fresh root, and which issues from it in many points, when recently cut or broken.* It has received other appellations, such as the Puccoon, Turmeric, Red Root, &c. It is indigenous to this country, and may be found from Canada to the Floridas. It flourishes best in rich woodland, and on the declivities of hills. As it is among the first plants whose efflorescence announces the approach of spring, it may prove interesting to the florist, as well as of utility to the physician. In the state of Georgia it is found very abundantly, and grows from six to eight inches in height.

---

* A similar juice flows also on cutting the leaves and footstalks.

Root, horizontal, tuberous, perennial.

Stem, slender, round, glabrous.

Leaves, reniform, united at their base, serrated, and deeply lobed, of a pale green on their upper surface, and glaucous or bluish white underneath.

Foot stalk of the flowers, radical.

Flowers, simple, terminal, white.

The Sanguinaria Canadensis has, for a long time, held a subordinate station as an article of medicine, and but gradually become distinguished amongst the confused groupe which composes the recipe of the vulgar. The Indians employ it for painting themselves, and hold it in high regard for its medicinal virtues. A few physicians have been acquainted with some of its virtues, and it has been used by empirics as a nostrum. A quack, in the city of New-York, makes use of a nostrum, consisting chiefly of the Sanguinaria, for the purpose of removing "female obstructions." Schoepf has spoken both of the emetic and purgative power of the blood root; of its use in gonorrhoea, and against the bites of serpents, in bilious disorders, &c. It has been employed in a number of diseases, in which emetics and sudorifics were indicated. In New-England and in the Southern states, recourse has been had to the alcoholic infusion of the Sanguinaria as a tonic bitter, in different diseases, and as a prophylactic against intermittent fevers. Professor W. P. C. Barton has used it in this form, and, he states, "with the manifest effects of increasing the appetite and tone of the stomach." It has also been used as a sternutatory and escharotic. In an Inaugural Dissertation, published by Dr. Downey, at Philadelphia, we find that he considers the proximate principles of the Sanguinaria to be resin, gum, and an extractive, or saponaceous matter, and that the gum is greatest in quantity, and contains the active principle of the plant. His experiments with the leaves and seeds induce the conclusion, that they are powerful and diffusible stimuli, and that the seeds exert "a very considerable influence over the pulse, and a stupifying narcotic quality."

In the experiments made by Bigelow upon the root, it would appear that it possesses neither gum nor extract, but a peculiar resin, a bitter and acrid principle, and fecula.*

---

* Let it be remembered that the re-agents which were used by these gentlemen, (Downey and Bigelow,) were few in number, and not calculated to develope the active principle of the plant.

To acquire a more correct and satisfactory knowledge of the peculiar properties of the Sanguinaria, and its virtues as a medicine, I instituted a series of experiments. Its utility in the treatment of diseases, as deduced from the analysis, with the advantages which the writer has enjoyed of witnessing its effects in several diseases, will be considered in the subsequent part of this Dissertation.

EXPERIMENTS.

Decoctions were made of the recent and dried root: to an ounce of each of which, bruised, and put in separate glass vessels, was added one pint of distilled water. After having been subjected to the heat of a lamp, and boiled for an hour, they were filtered through paper. The decoction of the recent root, was of a darker colour, but, to the taste, they were both bitter and acrid, and presented but little difference in their properties; a fact which contradicts the assertion of Dr. Tully, that the virtues of the root are materially impaired by age.

SERIES I.

When the Sanguinaria is digested in a moderate heat, with distilled water, an opaque solution is formed, which becomes clear on passing it through a filter. The filtrated liquor is of an orange colour; it has a peculiar smell, and a nauseous bitter taste.

The solution was examined by the following re-agents: nitrate of silver caused a copious precipitate, of a yellowish brown colour, and of considerable specific gravity. Litmus had no effect upon the colour of the solution. With per-sulphate of iron, a moderate precipitate was induced, after a lapse of several hours. Nitrate of mercury produced a slight precipitate under the same circumstances. Succinate of ammonia effected no alteration. With the oxalate of ammonia a turbidness was produced. Nitro-muriate of platina caused an immediate opacity. The same change was produced by the muriate of cobalt, and the nitrate and muriate of barytes. The addition of ammonia changed the solution to a greenish yellow colour. Acetate of lead formed a precipitate of an ochre yellow colour. With chromate of potash no sensible effect was produced. A solution of iodene gave to it a deep reddish brown colour. With a solution of potash a lemon yellow was created. Carbonate of potash caused a precipitate which was soon followed by a precipitate. Tincture of galls, effected no immediate change, but in an hour, a precipitate of a wax yellow colour was formed. Muriate of tin (recently prepared) induced an abundant flocculent precipitate of an ochre yellow colour. With gelatine no change was produced. Tartarized antimony caused a cloudiness. Sulphuric acid had no effect.

SERIES II.

A decoction of the fresh root, prepared as in the first experiment, is of a bright orange red colour.

With tartarized antimony an immediate opacity was produced. Solution of iodene caused a copious brownish black precipitate. Nitro-muriate of platina caused a copious flocculent precipitate of a vermilion red hue, at the same time depriving the solution of its colour. Acetate of lead induced a dense yellowish brown precipitate. With muriate of barytes no precipitate was formed. The per-sulphate of iron changed it to a dark colour. Litmus had no effect upon the colour of the solution. Sulphuric acid induced a slight scarlet precipitate. Tincture of galls caused an abundant precipitate of a yellowish brown colour. Gelatin produced no change. Muriate of tin formed a copious precipitate. With succinate and oxalate of ammonia no effect was produced. Nitrate of mercury caused an instant turbidness and thickening of the solution. With solution of potash the infusion was immediately changed to a pale green. Ammonia destroyed completely its colour and a copious precipitation followed. With nitrate of barytes an orange coloured precipitate was induced.

SERIES III.

The alcoholic infusion of the root* is of a dark red colour, and extremely bitter and acrid to the taste. With re-agents this infusion exhibited the following appearances:

---

* The root from which this infusion was prepared had been gathered twelve months, and, from the action of the different tests upon it, we should infer no loss of its properties by age.

A solution of iodene caused a turbidness which was followed by a brownish red precipitate. Tincture of galls induced a dense orange coloured precipitate. Solution of potash formed a dense whitish precipitate, the supernatant fluid having its colour darkened. With litmus no apparent change was produced. Ammonia occasioned a dense brownish coloured precipitate. Nitric acid precipitated its colour. Sulphuric acid induced a red precipitate. Muriatic acid caused a slight discolouration. Carbonate of potash formed an abundant precipitate of a brownish appearance. With nitrate of barytes no change was produced. Nitrate of mercury occasioned a copious precipitate. Muriate of tin induced a dense orange precipitate. Per-sulphate of iron caused a dense precipitation. Nitrate of silver produced no change. Acetate of lead formed a brownish precipitate. Nitro-muriate of platina created an extraordinary precipitate. With tartarized antimony a considerable precipitate was formed. Oxalate of ammonia produced a trifling effect. Muriate of cobalt formed a slight precipitate. The same was produced by the chromate of potash. Succinate of ammonia caused a copious precipitate. Muriate of barytes induced a striking effect. Distilled water induced an opacity, which was followed by a slight precipitate.

SERIES IV.

A portion of the alcoholic infusion was evaporated nearly to dryness. The residuum* was of a chocolate red colour, extremely bitter and acrid to the taste, and leaving a strong and rather painful impression upon the tongue. After remaining a day exposed to the atmosphere, it had abstracted moisture and become softer, but was still very adhesive. Distilled water took up from this extract all of its active properties, together with its colouring matter; leaving at the bottom of the capsule a small quantity of a carbonaceous material. The aqueous solution, when filtered, was of the colour of arterial blood, and, on examination, exhibited the following properties with re-agents:

---

* From three ounces of the tincture sixty-four grains of extract were obtained.

Nitrate of silver caused a copious and dense precipitate. Nitrate of mercury induced a copious precipitate of a reddish orange colour. With per-sulphate of iron a black precipitate was instantly formed. Nitro-muriate of platina produced an abundant precipitate. Acetate of lead caused no precipitation. Solution of potash created a considerable purple precipitate. Solution of iodene caused an immediate turbidness. Sulphuric and muriatic acids had no effect. Nitric acid induced a very dense precipitate. With tincture of galls a copious orange red precipitate was formed. Tartarized antimony produced a precipitate. Muriate of tin formed a precipitate.

SERIES V.

A portion of the alcoholic infusion was then distilled nearly to dryness. The distilled fluid had lost nearly all its colour, but retained much of the pungency and acridness of the tincture.

The following effects were produced with re-agents:

The per-sulphate of iron formed a slight precipitate, after the lapse of a few hours. Nitrate of mercury induced a white precipitate. With acetate of lead no change was effected. Nitrate of silver rendered it turbid. With tincture of galls a precipitate was produced. Muriate of tin occasioned a slight turbidness. A similar change was produced by sōlution of potash. Tartarized antimony formed a slight precipitate. Nitro-muriate of platina, solution of iodene, ammonia, muriate of barytes, and muriate of cobalt, produced no sensible effects.

SERIES VI.

In the following series, by means of the cold infusion which was next instituted, one ounce of the fresh root bruised, was put into a glass vessel, and a pint of distilled water added. It was suffered to infuse for twenty-four hours, and then filtered through paper. The infusion is of an orange red colour, and had a bitter taste. On examination the following appearances were produced.

Solution of iodene caused a turbidness, with an increase of colour. Nitrate of silver destroyed its colour, and, in a few hours, an orange coloured flocculent precipitate was formed. Muriate of barytes produced no effect. Acetate of lead induced a dense deposit. Per-sulphate of iron darkened its colour. Tincture of galls formed a precipitate. With tartarized antimony a precipitate was formed. Muriate of cobalt effected but a slight change. Nitrate of mercury induced a precipitate of a light red. Muriate of tin caused a thickening, which was followed by a precipitate. Solution of potash destroyed its colour. Ammonia created a discolouration of the fluid. With litmus, muriate of barytes, and sulphuric acid, no changes were made sensible. The addition of alcohol produced a cloudiness. Silicated potash formed a precipitate.

RESULTS.

Series first, with the dried root, proves the presence of extract, as is evinced from the precipitate formed by the nitrate of silver. The action of the per-sulphate of iron may arise from some modification of the gallic acid. The extractive matter was shown from the precipitate caused by the nitrate of mercury, and from the precipitate induced by the muriate of tin. The extractive principle was also evinced by the opacity occasioned by the muriate and nitrate of barytes, and the muriate of cobalt. The effect produced by the nitro-muriate of platina was owing to extract. The extractive principle was also made evident by the action of the alkalies, and the precipitate induced by the acetate of lead. The tincture of galls formed a precipitate which evinced the presence of cinchonin, and the same inference may be drawn from the effects occasioned by the tartarized antimony and solution of iodene.

From series second, the presence of gallic acid modified, was made more evident from the effect produced by the sulphate of iron.

It also contributes to the confirmation of the fact, long since observed by Seguin, viz. that the gallic acid is often unaccompanied by the tannin principle, as in cinchona, crude or roasted coffee, the roots of the strawberry plant, milfoil, and a number of others. The extractive matter was shown by the precipitate induced by the sulphuric acid. The green colour which the infusion acquired by solution of potash, and the changes wrought by ammonia are all referrible to the presence of extract. The resemblance of the precipitate in colour and specific gravity, as induced by the tincture of galls, to that which this reagent forms with the cinchona, shows the existence of an analagous principle to the cinchonin of cinchona. No change being caused by the oxalate of ammonia, the absence of lime may be inferred. Extract was also shown by the muriate of tin, nitro-muriate of platina, and by the nitrate of barytes. From the effects of tartarized antimony in this series, the principle which Dr. Duncan calls cinchonin,* would appear to exist. The copious brownish black precipitate which was formed by a solution of iodene, was supposed to arise from the action of cinchonin.

The third series proves, that alcohol extracts in a greater degree the active properties which exist in the decoction, and in addition, also a resinous matter. The red precipitate formed by the sulphuric acid, denotes abundance of extract. The alterations effected by the nitric acid are referrible to the presence of extract. The cinchonin principle was made more evident by the dense orange precipitate formed by the tincture of galls. The precipitation made by the addition of distilled water demonstrates the presence of a resinous material. Extract was also made evident by the action of chromate of potash. Modified gallic was readily evinced from the dense precipitation caused by the per-sulphate of iron. The abundant precipitate induced by tartarized antimony, leaves no room to doubt the presence of cinchonin. The change produced by the addition of iodene are ascribed to the same principle.

---

* See Dr. Duncan's experiments on the Peruvian bark in Nicholson's Journal, 8vo. vol. vi. p. 225.

Series fourth proves, that the properties of the plant undergo no material change in the temperature of boiling alcohol. Most of the re-agents which were used in the third series, were used in the aqueous solution of the extract; and the effects produced tend to corroborate the results of the preceding experiments. The black precipitate instantly formed by the persulphate of iron, readily discovered the presence of gallic acid. The copious and dense precipitate induced by nitrate of mercury was owing to extract. The orange-red precipitate induced by the tincture of galls, evinces that the cinchonin principle in the Sanguinaria undergoes no material change by heat. The same conclusion may be drawn from the effects of tartarized antimony and iodene. The precipitate formed by the addition of muriate of tin was also owing to extract.

I have stated the results of the simple decoctions, of the alcoholic infusions, and of the alcoholic extract, as taken up by water. In order to discover more satisfactorily the properties of the root as taken up by the latter menstruum, I subjected the tincture (fifth series) to the process of distillation. After the process had been continued, till nearly the whole had come over into the receiver, I employed the usual re-agents, and found all its properties discernable, though in a diminished degree.

To ascertain how far the properties of the plant may be taken up by the cold aqueous infusion, the sixth series was instituted. It is barely necessary to observe, that the virtues of the recent root are abstracted in a considerable degree by means of the cold infusion. The usual re-agents were employed, and the results were nearly alike. Cinchonin was made evident by the tincture of galls, tartarized antimony, and solution of iodene. The presence of extractive matter was proved by a variety of re-agents. Gum was made evident by silicated potash and the addition of alcohol.

To demonstrate particularly what peculiar principle in the Sanguinaria, iodene precipitates, I thought it of importance to continue my experiments with the ethereal solution of the root; in which solution, I found iodene, tincture of galls, and tartarized antimony to produce precipitates of a brownish appearance. Neither of these precipitates can be ascribed to the presence of gum or extractive matter, as both of these principles are insoluble in ether.* The phenomenon, as produced by iodene, is then referrible to the presence of the same principle which the tincture of galls and tartarized antimony precipitate. viz, the cinchonin of Duncan and Vauquelin. To place the point beyond the cavil of criticism, I made a few relative experiments with the cinchona cordifolia, the crocus sativus, and gum arabic. In the alcoholic and aqueous infusions of the bark, a solution of iodene produced brownish coloured precipitates. Upon the saffron, (which is known to consist chiefly of the extractive matter) iodene had no effect; neither did it evince any influence in a solution of gum arabic. That it does not act upon a resinous material, the changes it effected in the decoction of the Sanguinaria at once establish. That it is not fecula, we have only to refer to the precipitate iodene induced in the alcoholic infusion, a menstruum in which starch is insoluble. The difference in the colour of the precipitates as made by iodene in the various experiments, will also establish the point in question. Does not its action upon the Sauguinaria, then depend upon the presence of cinchonin, or the *Sanguinarin* of the Sanguinaria Canadensis?

---

* Brande's Chemistry.

From the experiments which were instituted, and the results which I have attempted to deduce from them, it will appear that the Sanguinaria Canadensis contains, first, cinchonin; secondly, extractive matter; thirdly, a gummy material; fourthly, a resin; and fifthly, gallic acid in a state of combination. Whether it is to be ascribed to the existence of extractive matter, an opinion which Dr. Thomson maintains, I do not pretend to determine.

We are warranted in the conclusion, from the evidence of the above analysis, that this plant possesses active medicinal properties, that these properties are *in every respect* similar to those which characterize the cinchona officinales.

As pharmacentical preparations of the Sanguinaria, the following are deserving of recommendation. The decoction, the infusion, the root in substance, pulverized, the tinctures prepared with proof spirits, and the spiritous extract. The vinous infusion has been recommended as being most pleasant, and at the same time the most powerful.

ON THE USE OF THE

SANGUINARIA CANADENSIS,

AS AN

ARTICLE OF THE MATERIA MEDICA.

THE list of tonics and bitters has of late been so greatly enlarged, by the addition of our indigenous vegetables, that I am well aware, with what little interest new substances of this character are regarded. The well known virtues of the various species of cinchona, of the quassia and columbo, recommend them to general use, and so long as these can be obtained with facility, practitioners will have few inducements to adventure in doubtful experiments. Indeed, it must be acknowledged, that among the plants of our own country, whose virtues have been investigated, none have been recently found superior or equal to those just mentioned. This, however, should not paralyze our efforts in investigating the properties of any of our native plants. Many of the substances in our Materia Medica, have properties *sui generis*, and may, by the peculiarity of impression which they make upon the human system, be better adapted to cure certain diseases, than others which apparently act with much greater force.

Of the substance under consideration, there can be no hesitation in offering an opinion as to its value as an article of the Materia Medica: it undoubtedly has more merit as a medicine, than many of the plants which have lately occupied the attention of the medical public. Hitherto physicians have forborne to institute a comparison between the chymical properties of our indigenous plants, as deduced from experiment, and those which are ascertained to belong to the Peruvian bark. I however think there is no doubt in the present instance. The supposed principle that has given merited celebrity to the bark of Peru, is ascertained in the foregoing analysis, to exist in considerable quantity in the Sanguinaria Canadensis; and it may be as readily asserted, that for its active medicinal virtues as a tonic stimulant, it will suffer no injury by comparison with any of the articles of our vegetable Materia Medica.

I have given the several opinions, respecting the modus operandi of this medicine in another place. It would be presumptuous in me to offer an opinion deduced from the aggregate of these contradictory reports: I have not been able to draw a decided conclusion from my own observation. The circumstances in connexion with its administration in various disorders will be detailed, and will establish the peculiarity of its action upon the system. Long continued experience has attested the usefulness of many of our barks and roots in the treatment of diseases; and I think further observation will discover and establish the salutary effects of the Sanguinaria, in a similar manner. Such may be considered the cinchona officinalis and the polygela seneka.

From the observation and experience of several eminent physicians, and from the opportunities which have been allowed me, of witnessing the employment of this plant, I am induced to believe it an important and salutary remedy in the treatment of several diseases.

Before I begin to enumerate the several affections in which its application has been found beneficial, it may be proper to mention that its action depends in a great degree upon the particular form in which it is administered. If it be exhibited as a warm decoction, it proves promptly emetic, and acts particularly upon the respiratory organs, in producing expectoration: if it be given in the form of a cold infusion or decoction, or in substance, pulverized; or in vinous or spiritous tincture, it proves a stimulating tonic.

The specific action of the Sanguinaria Canadensis upon the system is also determined by the proportion in which it is given. The well known aphorism of Pliny, *ubi virus, ibi virtus*, is fully applicable to the Sanguinaria. If prescribed in small doses, it acts by giving tone to the physical powers, and excitement to the mind. If given in sufficient quantity to offend the stomach without causing emesis, it proves a stimulating expectorant; and if still further increased, it vomits. In improper quantities its action is violent; producing faintness, diminished vision, and great prostration of strength.*

Dr. Nathan Smith has recently made use of the Sanguinaria in diseases of the lungs and in croup; in which last complaint he considers it a sovereign remedy. Discrimination should be made in the stages of the latter disease, before this medicine is employed. From the very speedy operation of the warm decoction, as an emetic, and the stimulating effects which it occasions upon the mouth and fauces, advantageous results may be expected from its use in the last or *membranous* stage of croup. In this stage Dr. Smith may have found it beneficial: and from the history of the case, quoted by Thacher in his Dispensatory, I should judge the patient to have been in the latter stage of the disease. Indeed the objections urged against the polygela seneka, when administered in the active stage of croup* must equally apply to the use of the Sanguinaria in the same stage of this disorder.

---

* Tully, in New England Journal of Medicine and Surgery, vol. viii.

Dr. Barton is of opinion, that the Sanguinaria is allied in properties to the rattle-snake root, and promises to be a valuable substitute, particularly by its emetic and expectorant effects, in cases of cynanche maligna, trachitis, and other similar affections. Mention is made of that particular form of trachitis, which Dr. Darwin has named peripneumonia trachealis, in which the decoction of the Sanguinaria was given with evident good effects.

The Sanguinaria has also been used in phthisis pulmonalis, in pneumonia typhodes, and in purtussis.

---

* See Dr. Hosack's paper on croup in the American Medical and Philosophical Register, vol. ii.

In the incipient stage of phthísis, the Sanguinaria, as a stimulating emetic and expectorant, cannot but be pernicious. It may perhaps subserve in combating and palliating symptoms, in giving tone to the weeping vessels of the lungs when the secondary stages of the disease ~~has~~ have taken place.

It has received great praise from Professor Ives, from its efficacy in the treatment of pneumonia typhodes; as the disease prevailed some time since to a very great extent in the eastern states. Dr. Tully found it an important adjuvant in the course ordinarily pursued in the treatment of this particular affection.

These gentlemen recommend the Sanguinaria upon the same principle in the cure of purtussis.* From the politeness of a physician in this city I have had an opportunity of trying it in the case of a female child about four years old, labouring under this disease. She had been ill about two weeks when I first saw her, and had taken no medicine for relief; cough frequent, and often ending in vomiting; pulse small and quick, with a costive state of her bowels. I gave her a saline cathartic, which freely evacuated the intestinal canal. Twenty-four hours after I called to see the child, found the symptoms about the same. I now gave the warm decoction of the Sanguinaria, a tea-spoonful every fifteen minutes until it proved emetic, and continued the medicine until it vomited the child several times. It may be proper to mention that in this instance the emetic effect was produced after taking two tea-spoonsful of the decoction, and that emesis immediately succeeded every subsequent doze that was given. I called to see the child again on the third day, and it was the mother's impression that the child's fits of coughing were not so frequent or protracted.

---

* See Bigelow's Medical Botany.

I continued the use of this medicine with a cathartic occasionally for several days. The fits of coughing gradually shortened in their violence and duration until they ceased, with the perfect restoration of the child's health and strength.

From the success of this case, and from the confirmatory observations of Ives and Tully, I should pronounce the Sanguinaria, when given with a view to its emetic effects, a valuable medicine after the inflammatory action which attends the commencement of this disease is subdued by proper evacuants.

No particular reference has as yet been made to the tonic powers of the Sanguinaria, except by Professor Barton and

Dr. Macbride of Charleston, South Carolina. The latter gentleman has found it of utility "in torpor of the liver, attended with colic, and yellowness of the skin." He has made frequent trials with it, in jaundice, with evident advantage.

There seems to be a difference of opinion among the physicians, who have experimented with the Sanguinaria, as to the manner in which it proves successful in the cure of jaundice. Dr. Barton thinks that it proves efficacious, so far as it possesses emetic properties. Drs. Smith and Israel Allen, of Stirling, suppose that its operation is analagous to that of digitalis upon the system, and that it should be preferred to the latter medicine, as being more immediate in its action, and less dangerous in its effects. The reader need only refer to the analysis which has been given in the first part of this dissertation, to perceive the futility of the opinions of the two last-mentioned gentlemen, and the proper principles which should direct the administration of the Sanguinaria in the treatment of jaundice. When the disease arises from obstruction to the passage of bile into the duodenum, and a consequent absorption or regurgitation of the bile into the circulating system, the emetic tartar and ipecacuanha should be preferred to the Sanguinaria, in unlocking the constriction and disgorging the liver. But when jaundice is owing to a torpor or fixed obstruction of the organ, the Sanguinaria as a tonic and deobstruent, has proved of permanent advantage in the hands of Dr. Macbride and other physicians of eminence in the southern states.

RHEUMATISM.

The remedies which have been recommended, both in the acute and chronic form of this disease, are almost without number. Mention is made by Professors Smith and Ives, of the Sanguinaria in the treatment of acute rheumatism. They recommend it in tincture or decoction, to be given till its operation upon the skin and system generally becomes manifest. From the analysis I have made, and the opportunities I have had of witnessing its effects in the acute form of this disease, I should consider it highly aggravating, where there is inflammatory action. In a formidable case of rheumatism, combined with gout, after the active symptoms of the disease had been removed, by copious bloodletting and cathartics, I found the tincture of the Sanguinaria powerfully efficacious in restoring the tonic powers of the stomach and functions of the intestinal canal.

If we could sanction the mode of treatment, as adopted by Drs. George Fordyce,*

---

* See his third Dissertation on Fever.

Haygarth,* Fothergill, and others, we might consider the Sanguinaria as promising to be an important substitute to the Peruvian bark in the treatment of inflammatory rheumatism. With due deference to the high authority of Professors Smith and Ives, I am however induced to think, that depleting measures should precede the use of the Sanguinaria in this species of inflammation. When the active stage has been removed, and nothing but a partial excitement remains, the Sanguinaria may then be administered with evident advantage. In illustration of this view, the following cases are inserted.

CASE I.

Mrs. M. B. aged 35, of a fair complexion, complains of great pain in the course of her thighs, and knee and ankle joints. Her system is much weakened from the obstinacy of the disease, and the repeated use of opiates. Her knees and ankles are enlarged, and manifest the usual symptoms of rheumatism in the passive stage; pulse full and frequent; skin hot; bowels costive; with the tongue furred in the centre. She had made use of no remedial measures except the occasional application of volatile linament to the knees and ankles, and the use of anodyne medicines: it then being the twenty-second day of her illness, I gave her a saline cathartic in combination with a small quantity of tartar emetic.

---

* See Dr. Haygarth's Clinical History of Acute Rheumatism.

September 7. She complains of less pain; pulse full and soft; skin moist; tongue assuming a more healthy appearance. I now administered the Tinctura Sanguinariæ; thirty drops to be taken three times a day.

September 9. Says the medicine perfectly agrees with her; bowels regular; the swelling in her left knee and ancle not so great, but continues painful: increased the dose to forty drops.

September 12. The swelling is going down in both of her knees; pains slight; her strength begins to improve, and her appetite is returning; pulse natural; bowels slow: ordered a mild cathartic; have increased the dose of her medicine to fifty drops.

September 15. Continues to take the tincture; has more strength; appetite better; swelling nearly gone down; no pains of consequence; complains of stiffness in her knee joints; pulse natural; skin moist and cool.

September 19. This morning she says her pains have returned, from an improper exposure the day previous; enjoined her to be more cautious; ordered flannel bandages to her lower extremities: continues her medicine.

September 22. Found her entirely free from pain; strength restored, and attending to her domestic avocations: pronounced cured.

CASE II.

Miss M. B. aged 26, is affected with rheumatism in her shoulders. Her attack began about the 15th of August, though for several months before she had been troubled more or less with rheumatic pains in various parts of her body. Pulse small, and more frequent than natural; skin cool; bowels irregular; appetite impaired. I gave her the Tinctura Sanguinariæ; commencing with forty drops three times a day.

September 25. Found her symptoms about the same; the medicine agreed with her stomach; increased it to fifty drops, and ordered ten grains of pulvis Doveri, to be taken at bed-time.

September 26. She has passed a tolerably easy night; begins to move her arms without much pain; continues the use of the medicine; bowels have become regular.

September 29. The medicine agrees very well with her stomach; appetite improving; pains slight; ordered her to persevere in the use of her medicine.

October 5. Found her in good health; entirely free from pain; strength restored; appetite good; considered cured.

The result of the practice of Dr. A. D. Wilson, of this city, with the Sanguinaria, he has been so good as to give me on paper, and I feel great pleasure in affixing it to this Dissertation, as it throws still more light upon the tonic properties of the plant.

New-York, *March* 1, 1822.

Mr. F. Bird,

Sir—Having seen your manuscript analysis of the Sanguinaria Canadensis, I was inclined to believe that that plant might be exhibited with advantage, in diseases where tonics were indicated. I had a case at that time under my charge, of an affection of the liver, in which great debility had taken place from the continuance of the disease, and constant administration of medicines. In this case I had intended to have resorted to some tonic remedy, in combination with an alterative; but, in consequence of the result of your analysis, with which you have made me acquainted, I determined to give the Sanguinaria a fair trial. The event of the case you will see herewith subjoined. Your most sanguine expectations could not have predicted a more favourable result. I have also administered it in one case of chronic rheumatism, and in a case accompanied with partial excitement consequent upon acute rheumatism. with complete success.

Its action, when it does not offend the stomach, and is not given in sufficiently large quantities to produce catharsis, appears to be analagous to the cinchona officinalis. The circumstances in connexion with the cases which have fallen under my care, as treated with the blood root, I will give you in detail.

A. D. WILSON, M. D.

CASE I.

Miss E. S. P. aged 16 years and 6 months, had when I was first called to attend her been unwell for upwards of two years. She was naturally of a sanguine temperament; but by climate, manner of living, and by disease, her temperament partook latterly rather of the nervous sort. She was born in England, but was educated in France, and lived for some years in the West Indies. Her habit is delicate; appetite impaired; stomach frequently disturbed; tongue covered with a yellow fur; complains of a very unpleasant and nauseous taste in her mouth in the morning; lassitude, indisposition to motion; bowels costive, generally not more than one evacuation in eight or ten days, unless procured by some cathartic medicine; dull pain, and a sense of fulness in her right side, extending to the back: pain in her right shoulder, as if lightly compressed. On examination of the right hypochondrium, a considerable enlargement of the liver was evident, and in the left hypochondrium some enlargement of the spleen appeared to have taken place; was usually very much troubled with asthmatic symptoms, great difficulty of breathing, constant cough with large expectoration, and sometimes a considerable tightness of chest. When she first removed to the United States, was attacked with an autumnal intermittent, which either from the uncommon violence of the disease, or improper management of it, lasted for a long time, and ultimately ended in an obstruction of the liver. Jaundice long and protracted followed; since which time, she has complained of the above enumerated symptoms. She has been treated alternately by different remedies. Mercury (in which form I cannot pretend to say) had been resorted to about ten months since, but without much evident or durable advantage. The symptoms were for a short time moderated, but soon returned with equal violence. It is now upwards of four months since I was first called upon. It should be recollected that the catamenia have never made their appearance. After freely emptying the bowels by stimulating cathartics, I administered the extract of Sanguinaria in pills, of one-eighth of a grain, twice increased to one-fourth, two and three times a day. The first action of this remedy was seemingly violent. It appeared to exert its influence principally upon the stomach and bowels, producing nausea, violent griping, and pretty constant catharsis. Upon the third or fourth day a discharge of blood took place from the bowels. During the second week these effects did not manifest themselves; the violent catharsis ceased, but the bowels were kept soluble and regular. No sensible change as to its action upon the system was as yet manifest. During the third and fourth weeks, the extract was administered in one-fourth grain pills three times a day. Violent pains in the back for a day or two were induced, resembling those attendant upon dysmenorrhœa. The pulse during the whole of this period remained nearly stationary, being small and quick. The bowels continued regular, but no favourable change as to the colour of the discharge was manifest. At the sixth week, the pills were laid aside, and the tincture given in doses of thirty drops three times a day. Upon the fifth day of the administration of the tincture, the pain in the side became so acute, that I deemed it adviseable to discontinue its use for a time. The pulse became fuller and hard, the pain continued, and was increased upon pressure. I then applied a blister to the right hypochondrium, when the pain abated. The Sanguinaria was still discontinued; the bowels being costive, they were for a short time kept open by saline cathartics. At the eighth week the use of the Sanguinarian tincture was resumed, in doses of twenty drops three times a day. Some time during the tenth week, the catamenial discharges made their appearance. Her pulse now was soft and natural; the billiary secretions were restored; all pain had subsided; cough removed; digestion healthy; stools figured and of a natural aspect. Her catamenia have since returned regularly, and her health is perfectly restored.

CASE II.

Mrs. S. M. aged 44 years, had been for a long time complaining of rheumatic pains in the back and lower extremities. She became at length unable to leave the room; the pains at times somewhat abated; the pulse small and quick; considerable debility and emaciation had taken place, from the constant irritation of the disease upon the system. I ordered the tincture of the Sanguinaria to be administered, twenty drops three times a day. This at first produced considerable nausea, but no perceptible diaphoresis. The nausea which was at first produced, gradually disappeared. The appetite and general health, after its use for a short time, became improved. The pulse became natural, and pains considerably abated, and were totally removed by a steady perseverance in the use of this medicine during three weeks. In this case the bowels were not much affected.

CASE III.

Mr. H. S. in February last, was attacked with acute rheumatism. He was treated antiphogistically; viz. large and repeated saline cathartics and diaphoretics were resorted to. By these remedies the inflammatory action was subdued, but the system was left very much debilitated; to remove which, the Sanguinaria Canadensis was administered. It was given in tincture, thirty drops, and increased to forty drops three times a day. The pains, for the first three or four days, returned, but within a short time totally disappeared; when a recovery of the patient's strength was the result.

A. D. W.

INTERMITTENT FEVER.

From the evidence which analysis affords, and from the practical experiments which have been made with the Sanguinaria, we have every reason to believe its efficacy in intermittent fevers, as well as in diseases of general debility. It has already proved a remedy in cases of obstructed liver, and been found capable of renovating the system, when debilitated by constant irritation It has proved a barrier to the invasion of intermittents, and upon what ground should we deny its influence in removing the disease after once formed? The principle upon which its tonic power depends, has been in the former part of this Dissertation clearly unfolded: and while we reflect upon the superior virtues of the cinchona, we should not lose sight of the Sanguinaria of our country, which promises to be the most important substitute.

On the medicinal virtues of the Sanguinaria Canadensis, Dr. FRANCIS, of the University of New-York, has obligingly favoured me with the following letter.

New-York, March 19th, 1822.

DEAR SIR,

I am much pleased to find that you purpose to investigate, at some length, the chymical and medical qualities of the Sanguinaria Canadensis, and to arrange your observations in the form of an inaugural thesis. The experience I have had of the medicinal properties of this plant, which, however, has been limited, convinces me that it possesses potent virtues, and that it may be rendered a valuable article of the Materia Medica. I am apprehensive that it has been sometimes prescribed where neither the form nor stage of the disease warranted it, and that this circumstance has in no inconsiderable degree operated to its disadvantage among practitioners. In cases of high general excitement, and in active local inflammations, given in the manner it has been recommended, it must prove injurious, and I should prescribe it with much caution in incipient inflammations of the lungs. In this condition of the system, given in large doses, it will prove too irritating; while in moderate portions it is well known to be a tonic stimulant: but in the succeeding stage, after the antiphlogistic means have been employed, the Sanguinaria will often be found of service.

I have had recourse to it with essential benefit in a long protracted and distressing affection of the chest. The patient had laboured under repeated attacks of pneumonia, and notwithstanding very active treatment, had suffered by hæmorrhage from the lungs: the consequences were, much constitutional debility and habitual returns of spasmodic dyspnœa, similar to those of pertussis. The tincture of the Sanguinaria, to the amount of twenty or twenty-five drops three times a day, has obviated the most formidable symptoms, and given strength and vigour to the constitution.

You are fully aware how confidently it has been recommended by Dr. Tully and

Dr. Ives in the early stages of croup. In the management of croup, after the active form of this disease is gone by, and when the membranous effusion exists, the Sanguinaria may perhaps be of utility, on account of its active emetic powers; but I should not be disposed to place reliance on it. In so hopeless a condition I know of nothing comparable to the free use of the vitriolic emetics.

In a formidable case of acute rheumatism occurring in a gouty habit, I lately administered the Tincture of the Sanguinaria with evident good effects: having previously prepared the patient, by copious blood-letting, cathartics, and sudorifics. The quantity taken was thirty drops three times a day: it improved the general tone of the system, and gave vigour to the digestive organs.

On the authority of Shoepf and Colden, the Sanguinaria was long ago noticed as an antidote to the poison of venomous animals, and as a remedy in bilious and other diseases. A most intelligent friend, Mr. John D. Hunter, now of this city, who has resided for about fifteen years among the western tribes of Indians, informs me that the Sanguinaria is held in the highest estimation by them, and that free use is made of it in various disorders. The Chippeways, the Shawanees, the Osages, and many other tribes of Indians who inhabit the countries watered by the Mississippi, consider it a powerful stimulating tonic, and accordingly prescribe it freely in pulmonic affections and in acute rheumatism, after active sudorifics have been employed. Its reputation is also high among them as an emetic and as a diuretic. As an emetic however, it is not, in their view, to be ranked with the Indian physic: as an escharotic, the application of it in a pulverized form is very common. In short, the Sanguinaria is classed among their most efficient and popular remedies.

Make such use of these facts as you may see proper, and believe me to be,

With great esteem, your friend,

JOHN W. FRANCIS.

Mr. Fitzgerald Bird.

About to receive the honours of the University in which I have acquired the elements of my medical education, I should consider myself deficient in proper feelings of respect and gratitude, did I not now present my grateful acknowledgements to the respective Professors of the College, for the liberal aid afforded me by their able lectures during the progress of my medical studies. May that portion of American youth, whose object is eminence in the profession of medicine, look to this University as the purest fountain of instruction.

THE END.